

# English Essay

Date: 21/07/2023

## Climate Change: Causes, Effects and Solutions

writing expression, content, evidence with references are fine

### Outline

add hook, discuss elements of topic according to demand.

#### 1. Introduction

Thesis Statement: In the form of deadly disasters and hazards, the climate attack is already? affecting cities, ecosystems, food production and flora and fauna. At the same time, it is fuelling conflicts, terrorism and migration. The wide literature on climate change has proven beyond doubt that anthropogenic activities, especially the industrial revolution of 1950s, are the driving forces of the climate attack.

Solutions are not mentioned →  
write concisely →

#### 2. Causes of Climate Change

discuss in detail

2a.

Defining Climate Change

2b.

A Human-induced Disaster

Effects: use topic key words

#### 3. The Horrors of the Climate Crisis

3a.

Increasing frequency and Intensity of Disasters: ~~2022 Disasters~~

3b.

~~Concern~~ Increasing Pace of Rising Temperatures

3c.

Outbreak of water-borne and vector-borne Diseases

3d.

Increasing Migration and

generic

3e.

clarify

~~Mental Health Issues~~  
Climate Terrorism: Climate Change as an Opportunity for Terrorist Groups

3f.

induced

~~Climate Crisis and Growing Economic Losses~~ Climate-

3g.

~~Flora and Fauna: Growing Danger of Animal Extinction~~ Species

3h.

The Divide Between Developed and Developing Nations

Solutions of

clarify

4.

Addressing the Climate Crisis: Global Action

4a.

Critically Evaluating the Kyoto Protocol

4b.

Critically Evaluating the Paris Agreement

4c.

The Way Forward: Conventional Methods, Negative Emissions Technology and Radiative Forcing Geoengineering Technologies

unclear and similar

Make proper

5.

~~The Way~~

5.

Conclusion

headings

Hook is missing

Climate change is the most serious and pervasive threat that the world has ever come across. It has severe and unprecedented consequences for not only the human race, but all life on earth. In the form of deadly disasters and hazards, the climate attack <sup>Chapter</sup> is already affecting cities, ecosystems, food production, ~~and~~ flora and fauna. At the same time, it is fuelling conflicts, terrorism and migration. The wide literature on climate change has proven beyond doubt that anthropogenic activities, especially the industrial revolution of 1950s, are the driving forces of the climate attack. Regardless of this, the status quo maintained by world leaders, and in particular, that of developed nations, is further exacerbating the situation. Considering this, the paper begins by elucidating how climate change is mainly driven by the human race. It then, focusses on the horrors of the climate attack and how it is disproportionately affecting the ~~developed~~ developing nations. Next, it assesses current mechanisms in place for mitigating the effects

Intro should be more than just the summary of the

It should also contain the importance of topic as well as your understanding of it.

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of the climate disaster. Finally, it lays down solutions for combatting climate change.

Climate Change refers to the change in climate patterns, mainly caused by greenhouse gas (GHG) emissions, define Samer Fawzy et al (Strategies for Mitigation of Climate Change: A Review, 2020). Today, 50 billion tonnes of GHGs are emitted (measured in carbon dioxide equivalents) every year, the energy equivalent of "400,000 Hiroshima class atomic bombs exploding every 24 hours, 365 days a year" (Kirti Joshi, Climate Change Debate, Oxford Union). While both natural systems and human activities are the prime sources of such emissions, anthropogenic activities, particularly, energy production, industrial activities and those linked to forestry are the driving forces of the climate attack. The human population, at the same time, has increased by 300-fold in the last 70 years (UN Population Division, 2020) which is further exacerbating the situation by fuelling demand for energy and animal products, yet resulting in the release

Why different links are used?

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of more and more emissions every year. Yue and Gao, in their article, Contributions of Natural Systems and Human Activity to Greenhouse Gas Emissions (2018) thereby, conclude that the natural system of the earth is self-balancing, and the Intergovernmental Panel on Climate Change (IPCC) furthers this by claiming that it is merely human activities that are creating the extra pressure.

The growing horrors of the climate crisis are best encapsulated by Barack Obama, who at the Paris Accord expressed that "There's one issue that will define the contours of this century more than any other, and that is the urgent threat of a changing climate." To elucidate this, anthropogenic activities have resulted in an increase of  $1^{\circ}\text{C}$  in the global temperatures (also known as global warming) over the pre-industrial levels, and per the Centre for Research on the Epidemiology of Disasters, this resulted in 387 natural hazards and disasters in 2022 alone, higher than the average of 370 between 2002 and 2021. This included, 176

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cases of flooding, 22 cases of droughts, 12 cases of extreme temperatures, 108 cases of storms and 15 cases of wildfires. Due to this, 185 million people were affected and a total loss of US \$223.8 billion was reported in 2022.

In light of this, the concern today is not that the temperatures on earth are rising but rather, the pace at which they are increasing. On 3rd July 2023, the highest ever average global temperature of  $17.01^{\circ}\text{C}$  was recorded (US National Ocean and Atmospheric Administration (NOAA) 2023), and according to the IPCC, if emissions are not cut down, temperatures are likely to hit the  $1.5^{\circ}\text{C}$  mark (over the pre-industrial levels) between the years 2030 and 2052. This as many scientists and think tanks have evinced, can lead towards a mass extinction event as at the present rate of emissions, the Antarctic and Greenland mass is diminishing at unprecedented levels (NASA), and moreover, glaciers are retracting everywhere from the Alps to Africa,

expanding sea levels at an extraordinary pace of 3mm a year. Rising temperatures would increase the severity of wildfires, rains, extreme temperatures and more importantly, floods and droughts, as compared to the 2022 levels which will affect at least 300 million people living in coastal zones by 2050 and may engulf 11 cities, including Dhaka, Bangkok, Houston, Venice and Rotterdam by 2100 (The World Bank; The World Economic Forum, 2019).

One of the far-reaching effects of the climate catastrophe have been the rise in water-borne and vector-borne diseases. The World Health Organisation (WHO) notes that warmer temperatures may spread infectious diseases such as dengue, Chikungunya and Zika to as much as one billion people. This is evident from the cases of diseases linked to mosquitoes, ticks and fleas in the USA where from 2004 to 2016, the number of cases increased from 30,000 to 100,000, and it is estimated that between 2030 and 2050, over 250,000 people can lose their lives to such diseases. Similarly,

the impact of floods on spreading diseases is evident from the 2022 'historic' floods in Pakistan which forced around 5.4 million people, and more importantly, 2.5 million children in the affected regions to rely solely on contaminated water (Unicef, 2023). This among other factors, resulted in an outbreak of water-borne diseases such as diarrhoea, and cholera, as well as malaria, fever, and skin and eye infections (International Rescue Organisation, 2022).

discuss present effects first in para

↓  
 Apart from this, climate emergency will force people to migrate within or outside their countries due to growing sea levels, melting glaciers, thawing permafrost etc. Studies in this area reveal that crossing borders is a highly stressful activity, especially when citizens are unwilling to accept or welcome 'climate refugees'. The economic challenges faced by migrants add another layer of stress burden which significantly raises the chances of suicide and mental health issues (Susan Clayton, Climate Anxiety: Psychological Responses to Climate Change, 2020). Of even more concern are the the impacts of migration on



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children as they are more vulnerable to the effects of the climate crisis as compared to their adult counterparts. This is because, they are more dependent on their family members and social support networks which may be disrupted by migration and thus lead to mental health disorders such as PTSD, sleep disorders, and depression among others. Also, stress in earlier years may result in mental health issues later in life. This suggests that while climate change has a catastrophic effect on children, they have little to no power to limit its effects.

Related to migration is the issue of terrorism, aggression and conflict. The US Department of Defence has referred to the impacts of the climate catastrophe as "threat multipliers" and "catalysts for conflict." One example quoted in this regard by security experts is the exploitation for recruitment and influence by Al Qaeda in Northwest Africa due to desertification.

explain  
the point

Other than creating a heightened risk of diseases, increasing migration,

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terrorism and conflict, climate change has also has devastating impacts on infrastructure, economy, and flora and fauna. The effects of this vary from region to region and so do the intensity and types of disasters. For instance, infrastructure in coastal zones have primarily been affected by deadly floods whereas in the ~~west~~ <sup>developed world</sup>, wildfires have been the major cause. The 2022 unprecedented flooding in Pakistan resulted in the destruction of 2200 miles of roads, 1460 health facilities (which further exacerbated health risks) and 269 bridges. It further ruined 18,000 square kilometres of cropland, particularly, 45% of the cotton crop, one of the major exports of the nation, and killed at least 750,000 livestock (World Weather Attribution on the Pakistan Flood, 2022). This increased the stress burden of the urban poor, who not only lost their ~~own~~ homes and schools but also had to pay more for food. From the economic point of view, the same report highlighted that losses totalled to US \$ 30 billion, a huge setback for the already struggling economy.

Moreover, the 2019-2020 Australian

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Wildfires wreaked havoc and scorched at least 24 million hectares of land and killed around 483 people. At the same time, it killed or displaced almost 3 billion animals, risking the extinction of many animals such as blue-tailed skinks and rock-rats (WWF, 2022). Therefore, the impacts of the climate attack are not merely felt by the human population, but also by every specie existing on planet earth. As such, those who have played ~~no role~~ little to no role in fuelling the climate crisis are fighting an un-winnable battle.

More important is the disproportionate effect climate change has on developing nations. Although higher-income countries contribute to ~~86%~~ 86% of the total GHG emissions, increasing temperatures have far harsher effects on those living in developing countries, a population of 3 billion people (IPCC). The reason for this is slow economic development, increasing frequency of climate disasters and ~~lower~~ poorer access to healthcare facilities. Additionally, the UN provides that while the average <sup>Yearly</sup> temperature

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in developed nations is  $10^{\circ}\text{C}$ , developing countries have a ~~mean~~ <sup>mean</sup> annual temperature of  $26^{\circ}\text{C}$ . The latest example of warmer temperatures alongside the ~~lack~~ <sup>Proper</sup> lack of health facilities is the death of 4 patients at the Pakistan Institute of Medical Sciences in June 2023 who died of a heatstroke because of non-functional air conditioning.

In addition to this, developing countries are heavily dependent on agriculture and natural resources such as forests and lakes, and due to the increasing floods and droughts, water access has been heavily disrupted. In Pakistan, for example, the agriculture sector contributes to 24% of the total gross domestic product and employs nearly 50% of the total workforce. And, in 2017, 37% of the loss in crops was caused by floods and 19% by droughts.

In contrast, despite the growing threat of the climate crisis, developed countries are and will continue to operate and maintain their economic output by investing in renewable energy sources and alternate sources

Reference?

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of income. Developing countries are robbed of the same opportunity that the developed nations had in that they cannot now expand themselves in a carbon intensive fashion and later cut down GHG emissions. As a result, the economic output of developing nations is expected to diminish as the horrors of the climate attack continue to grow. Therefore, Ahsan Iqbal, Minister for Planning and Development in Pakistan has rightly stated that "The quality of life that people in the West are enjoying today, someone is paying the price [for it] in the developing world."

In sum, the climate Catastrophe is the greatest threat to have ever been faced by earth. Due to its extremities, the World Bank highlights that 100 million people, ~~for~~ 4 times the population of Australia, are headed for poverty by the year 2030. The globe is suffering a loss of US \$ 520 billion every year as more and more natural disasters and hazards continue to hit the earth. The latest examples of this are

not relevant to climate change directly →

the July 2023 tornadoes in the USA that damaged dozens of homes and killed 3 people in Indiana, heatstroke in Japan, the torrential downpours in Seoul, South Korea, massive flooding in Lahore, Pakistan, and cyclone Biparjoy which made a landfall in different parts of India and Pakistan in June 2023, injuring 22 people and taking away at least 6 lives. The above statistics therefore, confirm that "No challenge poses a greater threat to future generations than climate change" (Barack Obama), and humans must take immediate action to mitigate the far reaching effects of the climate reality before the tipping point is crossed.

*Too short para*  
Ever since its formation in 1992, the United Nations Framework Convention on Climate Change (UNFCCC) has been the driving force of climate action globally, and holds annual meetings (Conference of Parties - COP) between member states to cut down GHG emissions.

The 3rd COP made a major advancement and introduced the ~~Kyoto Prot~~ Kyoto Protocol, an international agreement to reduce GHG emissions.

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However, while many have welcomed this treaty and have referred to it as a breakthrough in international climate policy, others have criticised it on the ground that its approach is fatally flawed, especially in setting targets and timetables for the reduction of emissions. The sceptics, to a great extent have been correct. The reason for this is that the USA, the 2nd largest GHG emitter was not a party to this agreement, and only developed nations were assigned targets to lower down emissions. While Maamoun in his article, The Kyoto Protocol: Empirical Evidence of a Hidden Success (2019) reveals that emissions were reduced by 7.1% as compared to a "No-kyoto" scenario, ever since the 1990s, GHG emissions are being released at record levels. The reason for this is the exclusion of major GHG emitting nations from the Kyoto Protocol such as China, India, Brazil and South Africa. This, therefore, renders the success of the 1997 Protocol questionable and reveals the flaws inherent in it.

Furthermore, after the Kyoto Protocol and the 2012 Doha

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Amendment, the Paris agreement came into force under the UNFCCC with the aim of limiting the temperature of earth to  $1.5-2^{\circ}\text{C}$  over the Pre-industrial levels by the end of the century. It laid down a general framework of Pledge and review under which Voluntary Pledges made by member states to cut down emissions would be compared and reviewed at the global stage. Multi-criterion decision making approach would also be employed to prevent repeating the failures of the Kyoto Protocol.

As far as the success of this agreement is concerned, it has higher rates of participation as compared to the 1997 Protocol, however, it has little to no incentives for long term effectiveness. For instance, due to the growing economic ambitions and the China factor, the USA, under the Trump administration, ~~it~~ withdrew from the agreement. Further, while China, Russia, India, Iran, Indonesia and South Korea did not take the drastic measure of discarding the agreement, they failed to comply with the Pledges. Nonetheless, recent research ~~reveals~~ reveals that even if all Pledges are met, the earth is still



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Set to hit the  $3-4^{\circ}\text{C}$  mark (Young, The Paris Agreement: Destined to Succeed or Doomed to Fail?, 2016). This suggests that limiting temperatures to  $1.5^{\circ}\text{C}$  is still a dream.

As indicated above, current mitigation efforts are neither apt nor sufficient to achieve climate goals laid down by the Paris agreement. To achieve these goals, new measures and abatement routes must be taken. Firstly, conventional mitigation efforts must be deployed. This consists of adopting decarbonisation methods such as renewable energy, efficiency gains, fuel-switching, carbon capture storage and utilisation to reduce carbon dioxide emissions. Because energy-related emissions mainly contribute to the concentration of GHG emissions in the atmosphere, focus must be on both the demand and supply sides. For the supply side, this can be done by renewable energy, nuclear power, carbon capture and fuel-switch to low-carbon fuels like natural gas and renewable fuels. Whereas for the demand side, sector-specific and energy-efficient technologies must be used to limit energy consumption.

Apart from conventional methods, negative emissions technologies must be rolled out. This includes capturing and sequestering carbon dioxide from the atmosphere ~~with the help of~~ using bioenergy carbon capture and storage, enhanced weathering, ocean fertilisation, afforestation and reforestation (Goglio et al, Advances and Challenges of Life Cycle Assessment of Greenhouse Gas Removal Technologies to Fight Climate changes, 2020).

It must however, be noted that because these technologies are still in the development phase, primary focus should be on conventional methods as well as directing more financial resources to accelerate the production of negative emissions technologies.

Lastly, geoengineering technologies such as marine sky brightening, space-based mirrors and surface-based brightening can be used to reduce global temperatures. Unlike the negative emissions technologies, this can be done without altering GHG concentration in the atmosphere. The focus under ~~this technology~~ <sup>these technologies</sup> is on solar radiation management - increasing

Measures are part of topic so  
mention all these points by point  
in outline

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the reflectivity of earth by raising shortwave solar radiation which is reflected to space. But, these technologies are still theoretical or undergoing trials (Lockley et al, Geengineering and the Blockchain: Coordinating Carbon Dioxide Removal and Solar Radiation Management to Tackle Future Emissions, 2019) which suggests that more emphasis should be placed upon conventional methods, until these technologies are rolled out.

In conclusion, the economic greed of developed nations alongside the increasing vulnerability of developing countries paints a very gloomy picture, leading the world towards a mass extinction event. Not only has the climate attack <sup>severely</sup> ~~severely~~ affected the global economy, but has also ~~at the same time~~ increased poverty, water-borne and vector-borne diseases, mental health disorders, terrorism and migration. Moreover, it has had a brutal impact over flora and fauna, risking the extinction of many <sup>species</sup> ~~animals~~. Regardless of this, world leaders continue to ignore the climate crisis as if another planet, safe for human habitation exists. The world, therefore,

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needs to unite together under a single banner of climate action to combat climate change. Cooperation at the global stage must be enhanced, and latest technologies to lower down emissions must be adopted before the tipping point is crossed.

essay topic  
has 3 parts -  
refer to them in  
an essay proportion

Word Count: 2900  
(including references)

Time should be 2 hrs.  
45 mins max

Add a hook or  
conclusion too